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U. S. DEPARTMENT OF AGRICULTURE
Production and Marketing Administration
Grain Branch

HANDBOOK OF OFFICIAL GRAIN STANDARDS OF THE UNITED STATES

Standards for Wheat, effective October 1, 1937; Corn, effective January 10, 1937; Barley, effective July 1, 1937; Oats, effective June 1, 1947; Feed Oats and Mixed Feed Oats, effective July 1, 1935; Rye, effective July 1, 1941; Grain Sorghums and Flaxseed, effective July 1, 1935; Soybeans, effective September 1, 1949; and Mixed Grain, effective July 1, 1935

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1949

Prepared by the
Production and Marketing Administration

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BOOK NUMBER 1
M346Ha
1949

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Revised 1949

U. S. DEPARTMENT OF AGRICULTURE
PRODUCTION AND MARKETING ADMINISTRATION
GRAIN BRANCH

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Important Features of Grain Inspection

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1949

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. - Price 20 cents

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For further information regarding the United States Grain Standards Act, the regulations of the Secretary of Agriculture thereunder, or the official grain standards apply to any office of the Grain Branch, or to the Administrator, Production and Marketing Administration, Washington 25, D. C.

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HANDBOOK OF OFFICIAL GRAIN STANDARDS OF THE UNITED STATES

STANDARDS FOR WHEAT[1]

For the purposes of the official grain standards of the United States for wheat:

Wheat.—Wheat shall be any grain which, before the removal of dockage, consists of 50 percent or more of wheat and not more than 10 percent of other grains for which standards have been established under the provisions of the United States Grain Standards Act, and which, after the removal of dockage, contains not more than 50 percent of broken kernels of grain of any size. The term wheat in these standards shall not include emmer, spelt, einkorn, Polish wheat, and poulard wheat.

Classes.—Wheat shall be divided into seven classes, as follows: Class I, Hard Red Spring Wheat; Class II, Durum Wheat; Class III, Red Durum Wheat; Class IV, Hard Red Winter Wheat; Class V, Soft Red Winter Wheat; Class VI, White Wheat; and Class VII, Mixed Wheat.

Grades.—Wheat shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of its appropriate class or subclass, and according to the special grades when applicable.

[1] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Hard Red Spring Wheat (Class I)

This class shall include all varieties of hard red spring wheat, and may include not more than 10 percent of wheats of other classes. This class shall be divided into three subclasses, as follows:

Subclass (A) Dark Northern Spring

This subclass shall include wheat of the class Hard Red Spring Wheat consisting of 75 percent or more of dark, hard, and vitreous kernels. This subclass shall not include more than 10 percent of wheat of the variety Humpback.

Subclass (B) Norihern Spring

This subclass shall include wheat of the class Hard Red Spring Wheat consisting of more than 25 percent but less than 75 percent of dark, hard, and vitreous kernels. This subclass shall not include more than 10 percent of wheat of the variety Humpback.

Subclass (C) Red Spring

This subclass shall include wheat of the class Hard Red Spring Wheat consisting of not more than 25 percent of dark, hard, and vitreous kernels. This subclass shall also include wheat of the class Hard Red Spring Wheat consisting of more than 10 percent of the variety Humpback.

Class I.—Hard Red Spring Wheat

Grade requirements for (a) Dark Northern Spring, (b) Northern Spring, (c) Red Spring

Grade No.	Minimum test weight per bushel	Maximum limits of—					
		Damaged kernels (wheat and other grains)		Foreign material		Wheats of other classes	
		Total	Heat-damaged	Total	Matter except other grains	Total	Durum and/or Red Durum
	Lbs.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
1 Heavy [1] [2]	60	2	0.1	1	0.5	5	2
1 [2]	58	2	.1	1	.5	5	2
2 [2]	57	4	.2	2	1.0	10	3
3	55	7	.5	3	2.0	10	5
4	53	10	1.0	5	3.0	10	10
5	50	15	3.0	7	5.0	10	10
Sample grade	Sample grade shall include wheat of the subclass Dark Northern Spring, or Northern Spring, or Red Spring, which does not come within the requirements of any of the grades from No. 1 Heavy to No. 5, inclusive; or which contains more than 16 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.						

[1] Applies to each of the subclasses Dark Northern Spring, Northern Spring, and Red Spring.

[2] The wheat in grades No. 1 Heavy and No. 1 of this class may contain not more than 7 percent, and the wheat in grade No. 2 of this class may contain not more than 10 percent, of shrunken and/or broken kernels of grain and other matter that will pass through a 20-gage metal sieve with slotted perforations 0.064 inch wide by ⅜ inch long.

Durum Wheat (Class II)

This class shall include all varieties of common durum wheat, and may include not more than 10 percent of wheats of other classes. This class shall be divided into three subclasses, as follows:

Subclass (A) Hard Amber Durum

This subclass shall include wheat of the class Durum Wheat consisting of 75 percent or more of hard and vitreous kernels of amber color.

Subclass (B) Amber Durum

This subclass shall include wheat of the class Durum Wheat consisting of 60 percent or more but less than 75 percent of hard and vitreous kernels of amber color.

Subclass (C) Durum

This subclass shall include wheat of the class Durum Wheat consisting of less than 60 percent of hard and vitreous kernels of amber color.

Red Durum Wheat (Class III)

This class shall include all varieties of Red Durum Wheat, and may include not more than 10 percent of wheats of other classes.

Class II.—Durum Wheat and Class III.—Red Durum Wheat

Grade requirements for the subclasses (a) Hard Amber Durum, (b) Amber Durum, and (c) Durum, of the class Durum Wheat, and for the class Red Durum Wheat

Grade No.	Minimum test weight per bushel	Maximum limits of—					
		Damaged kernels (wheat and other grains)		Foreign material		Wheats of other classes	
		Total	Heat-damaged	Total	Matter except other grains	Total	Soft Red Winter, White, and Red Durum, singly or combined [1]
	Lbs.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
1 [3]	60	2	0.1	1	0.5	[2] 5	3
2 [3]	58	4	.2	2	1.0	10	5
3 [3]	56	7	.5	3	2.0	10	10
4	54	10	1.0	5	3.0	10	10
5	51	15	3.0	7	5.0	10	10
Sample grade	Sample grade shall include wheat of the subclass Hard Amber Durum, or Amber Durum, or Durum, or wheat of the class Red Durum Wheat, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive; or which contains more than 16 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.						

[1] These specifications do not apply to the class Red Durum Wheat, or to the subclass Durum.

[2] No. 1 Red Durum may contain 10 percent of wheats of other classes.

[3] The wheat in grades No. 1 and No. 2 of each of these classes may contain not more than either (*a*) 7 percent of shrunken and/or

broken kernels of grain and other matter that will pass through a 20 gage metal sieve with slotted perforations 0.064 inch wide by ⅜ inch long, or (*b*) 10 percent of all such material that will pass through said sieve together with the broken kernels of grain of any size which remain on said sieve; and the wheat in grade No. 3 of each of these classes may contain not more than either (*a*) 10 percent of shrunken and/or broken kernels of grain and other matter that will pass through said sieve, or (*b*) 15 percent of all such material that will pass through said sieve together with the broken kernels of grain of any size which remain on said sieve.

Hard Red Winter Wheat (Class IV)

This class shall include all varieties of hard red winter wheat, and may include not more than 10 percent of wheats of other classes. This class shall be divided into three subclasses, as follows:

Subclass (A) Dark Hard Winter

This subclass shall include wheat of the class Hard Red Winter Wheat consisting of 75 percent or more of dark, hard, and vitreous kernels.

Subclass (B) Hard Winter

This subclass shall include wheat of the class Hard Red Winter Wheat consisting of more than 25 percent but less than 75 percent of dark, hard, and vitreous kernels.

Subclass (C) Yellow Hard Winter

This subclass shall include wheat of the class Hard Red Winter Wheat consisting of not more than 25 percent of dark, hard, and vitreous kernels.

Class IV.—Hard Red Winter Wheat

Grade requirements for (a) Dark Hard Winter, (b) Hard Winter, (c) Yellow Hard Winter

Grade No.	Minimum test weight per bushel	Maximum limits of—					
		Damaged kernels (wheat and other grains)		Foreign material		Wheats of other classes	
		Total	Heat-damaged	Total	Matter except other grains	Total	Durum and/or Red Durum
	Lbs.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
1[1]	60	2	0.1	1	0.5	5	1
2[1]	58	4	.2	2	1.0	10	2
3[1]	56	7	.5	3	2.0	10	3
4	54	10	1.0	5	3.0	10	10
5	51	15	3.0	7	5.0	10	10
Sample grade	Sample grade shall include wheat of the subclass Dark Hard Winter, or Hard Winter, or Yellow Hard Winter, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive; or which contains more than 15.5 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.						

[1] The wheat in grades No. 1 and No. 2 of this class may contain not more than 7 percent, and the wheat in grade No. 3 of this class may contain not more than 10 percent, of shrunken and/or broken kernels of grain and other matter that will pass through a 20-gage metal sieve with slotted perforations 0.064 inch wide by ⅜ inch long.

Soft Red Winter Wheat (Class V)

This class shall include all varieties of soft red winter wheat and may include not more than 10 percent of wheats of other classes. This class shall be divided into two subclasses, as follows:

Subclass (A) Red Winter

This subclass shall include wheat of the class Soft Red Winter Wheat consisting of both light and dark colored kernels. This subclass shall not include more than 10 percent of Soft Red Winter Wheat grown west of the Great Plains area of the United States.

Subclass (B) Western Red

This subclass shall include wheat of the class Soft Red Winter Wheat consisting of more than 10 percent of wheat of this class grown west of the Great Plains area of the United States.

Class V.—Soft Red Winter Wheat

Grade requirements for (a) Red Winter, (b) Western Red

Grade No.	Minimum test weight per bushel	Maximum limits of—					
		Damaged kernels (wheat and other grains)		Foreign material		Wheats of other classes	
		Total	Heat-damaged	Total	Matter except other grains	Total	Durum and/or Red Durum
	Lbs.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
1 [1]	60	2	0.1	1	0.5	5	0.5
2 [1]	58	4	.2	2	1.0	10	1.0
3 [1]	56	7	.5	3	2.0	10	2.0
4	54	10	1.0	5	3.0	10	10.0
5	51	15	3.0	7	5.0	10	10.0
Sample grade.	Sample grade shall include wheat of the subclass Red Winter, or Western Red, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive; or which contains more than 15.5 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.						

[1] The wheat in grades No. 1 and No. 2 of this class may contain not more than 7 percent, and the wheat in grade No. 3 of this class may contain not more than 10 percent, of shrunken and/or broken kernels of grain and other matter that will pass through a 20-gage metal sieve with slotted perforations 0.064 inch wide by 3/8 inch long.

White Wheat (Class VI)

This class shall include all varieties of white wheat, whether winter or spring grown, and may include not more than 10 percent of wheats of other classes. This class shall be divided into four subclasses, as follows:

Subclass (A) Hard White

This subclass shall include all wheat of the class White Wheat consisting of 75 percent or more of hard (not soft and chalky) kernels. This subclass shall not include more than 10 percent of Sonora wheat or wheat of the white club varieties, either singly or in any combination.

Subclass (B) Soft White

This subclass shall include wheat of the class White Wheat consisting of less than 75 percent of hard (not soft and chalky) kernels. This subclass shall not include more than 10 percent of Sonora wheat or wheat of the white club varieties, either singly or in any combination.

Subclass (C) White Club

This subclass shall include wheat of the class White Wheat consisting of Sonora wheat or wheat of the white club varieties, either singly or in any combination. This subclass shall not include more than 10 percent of common white wheat other than Sonora, either singly or in any combination.

Subclass (D) Western White

This subclass shall include wheat of the class White Wheat which contains more than 10 percent of Sonora wheat or wheat of the white club varieties, either singly or in any combination, and which also contains more than 10 percent of common white wheat other than Sonora.

Class VI.—White Wheat

Grade requirements for (a) Hard White, (b) Soft White, (c) White Club, (d) Western White

Grade No.	Minimum test weight per bushel	Maximum limits of—					
		Damaged kernels (wheat and other grains)		Foreign material		Wheats of other classes	
		Total	Heat-damaged	Total	Matter except other grains	Total	Durum and/or Red Durum
	Lbs.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
1 [1]	60	2	0.1	1	0.5	5	0.5
2 [1]	58	4	.2	2	1.0	10	1.0
3 [1]	56	7	.5	3	2.0	10	2.0
4	54	10	1.0	5	3.0	10	10.0
5	51	15	3.0	7	5.0	10	10.0
Sample grade	Sample grade shall include wheat of the subclass Hard White, or Soft White, or White Club, or Western White, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive; or which contains more than 15.5 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.						

[1] The wheat in grades No. 1 and No. 2 of this class may contain not more than 7 percent, and the wheat in grade No. 3 of this class may contain not more than 10 percent, of shrunken and/or broken kernels of grain and other matter that will pass through a 20-gage metal sieve with slotted perforations 0.064 inch wide by ⅜ inch long.

Mixed Wheat (Class VII)

This class shall include all mixtures of wheat not provided for in the classes from I to VI, inclusive.

Grade requirements and designations.—Mixed Wheat shall be graded according to the numerical and Sample grade requirements of the class of wheat which predominates in the mixture, except that the grade specifications for the factor "wheats of other classes" and the grade specifications for "No. 1 Heavy" in the standards for hard red spring wheat, shall be disregarded.

The grade designation for Mixed Wheat shall be stated as provided in paragraph (a), (b), or (c) of this section:

(a) Except as specified in paragraphs (b) and (c) of this section, the grade designation for Mixed Wheat shall include successively, in the order named, (1) the number of the grade or the words "Sample grade", as the case may be, (2) the words "Mixed Wheat", and (3) the name and approximate percentage of each class of wheat which constitutes more than 10 percent of the mixture in the order of its predominance; but if only one class exceeds 10 percent of the mixture, the name and approximate percentage of that class shall be included in the grade designation, followed by the name and approximate percentage of at least one other class.

(b) **Amber Mixed Durum.**—Amber Mixed Durum shall be Mixed Wheat consisting of a mixture of Durum and other wheats, which contains not more than a total of 15 percent of wheats other than common durum and which contains not less than 60 percent of Durum kernels that are hard and vitreous and of amber color. Amber Mixed Durum may contain not more than 5 percent of red durum, white, and soft red winter wheat, singly or combined.

The grade designation for Amber Mixed Durum shall include successively, in the order

named, (1) the number of the grade or the words "Sample grade", as the case may be, and (2) the words "Amber Mixed Durum."

(c) **Mixed Durum.**—Mixed Durum shall be Mixed Wheat consisting of a mixture of Durum and other wheats, which contains not more than a total of 20 percent of wheats other than common durum. Mixed Durum may contain not more than 5 percent of Red Durum wheat, and may contain not more than 5 percent of white and soft red winter wheat, singly or combined.

The grade designation for Mixed Durum shall include successively, in the order named, (1) the number of the grade or the words "Sample grade", as the case may be, and (2) the words "Mixed Durum."

Dockage

Dockage includes weed seeds, weed stems, chaff, straw, grain other than wheat, sand, dirt, and any other foreign material, which can be removed readily from the wheat by the use of appropriate sieves and cleaning devices; also undeveloped, shriveled, and small pieces of wheat kernels removed in properly separating the foreign material, and which cannot be recovered by properly rescreening or recleaning.

The quantity of dockage shall be calculated in terms of percentage based on the total weight of the grain including the dockage. The percentage of dockage so calculated, when equal to 1 percent or more, shall be stated in terms of whole percent, and when less than 1 percent shall not be stated. A fraction of a percent shall be disregarded. The word "Dockage", together with the percentage thereof, shall be added to the grade designation.

Special Grades for Wheat

Tough Wheat

Definition.—Tough wheat shall be (a) wheat of any of the classes Hard Red Winter Wheat, Soft Red Winter Wheat, or White Wheat, or of the class Mixed Wheat in which wheat of any one of the classes Hard Red Winter Wheat, or Soft Red Winter Wheat, or White Wheat, predominates, which contains more than 14 percent but not more than 15.5 percent of moisture, and (b) wheat of any of the classes Hard Red Spring Wheat, or Durum Wheat, or Red Durum Wheat, or of the class Mixed Wheat in which wheat of any one of the classes Hard Red Spring Wheat, or Durum Wheat, or Red Durum Wheat, predominates, which contains more than 14.5 percent but not more than 16 percent of moisture.

Grades.—Tough wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

Smutty Wheat

Definition.—Smutty wheat shall be wheat which has an unmistakable odor of smut, or which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 14 balls of average size in 250 grams of wheat.

Smutty wheat shall be graded and designated according to the method described either in paragraph (a) or paragraph (b) of this section.

(a) **Smut dockage.**—Before the determination of smut dockage as provided in this paragraph, the wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not smutty. The smut shall be removed by scouring and the

loss in weight of the wheat caused by the removal of the smut shall be calculated in terms of percentage based on the total weight of the grain when free from dockage. The percentage so calculated shall be stated in terms of half percent, whole percent, or whole and half percent, as the case may be. A fraction of a half percent shall be disregarded. The percentage of the smut dockage, so calculated and stated, shall be added to the grade designation, preceding the statement of dockage, if any.

(b) **"Light Smutty" and "Smutty."**—Smutty wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not smutty; and

(1) In the case of smutty wheat which has an unmistakable odor of smut, or which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 14 balls but not in excess of a quantity equal to 30 balls of average size in 250 grams of wheat, there shall be added to, and made a part of, the grade designation, the words "Light Smutty"; and

(2) In the case of smutty wheat which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 30 balls of average size in 250 grams of wheat, there shall be added to, and made a part of, the grade designation, the word "Smutty."

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Garlicky Wheat

Definition.—Garlicky wheat shall be wheat which contains two or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of wheat.

Grades.—Garlicky wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not garlicky; and

(1) In the case of garlicky wheat which contains two or more but not more than six green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of wheat, there shall be added to, and made a part of, the grade designation, the words "Light Garlicky"; and

(2) In the case of garlicky wheat which contains more than six green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of wheat, there shall be added to, and made a part of, the grade designation, the word "Garlicky."

Weevily Wheat

Definition.—Weevily wheat shall be wheat which is infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Ergoty Wheat

Definition.—Ergoty wheat shall be wheat which contains ergot in excess of 0.3 percent.

Grades.—Ergoty wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Treated Wheat

Definition.—Treated wheat shall be wheat which had been scoured, limed, washed, sulphured, or treated in such a manner that its true quality is not reflected by either the numerical grade or the Sample grade designation, alone.

Grades.—Treated wheat shall be graded and designated according to the grade requirements of the standards applicable to such wheat if it were not treated, and there shall be added to, and made a part of, the grade designation, a statement indicating the kind of treatment.

Definitions

Basis of grade determinations.—Each determination of dockage, temperature, odor, garlic, and live weevils, or other insects injurious to stored grain, shall be upon the basis of the grain as a whole. All other determinations shall be upon the basis of the grain when free from dockage.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter other than wheat which is not separated from the wheat in the proper determination of dockage, except that smut balls shall not be considered as foreign material.

Other grains.—Other grains shall include rye, oats, corn, grain sorghums, barley, hull-less barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Damaged kernels.—Damaged kernels shall be kernels and pieces of kernels of wheat and other grains which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of wheat and other grains which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR CORN[2]

For the purposes of the official grain standards of the United States for corn (maize):

Corn.—Corn shall be any grain which consists of 50 percent or more of shelled corn of the dent or flint varieties, and may contain not more than 10 percent of other grains for which standards have been established under the provisions of the United States Grain Standards Act.

Classes.—Corn shall be divided into three classes, as follows: Class I, Yellow Corn; Class II, White Corn; and Class III, Mixed Corn.

Yellow Corn (Class I)

This class shall include yellow corn, and may include not more than 5 percent of corn of other colors. A slight tinge of red on kernels of corn otherwise yellow shall not affect their classification as Yellow Corn.

White Corn (Class II)

This class shall include white corn, and may include not more than 2 percent of corn of other colors. A slight tinge of light straw color or of pink on kernels of corn otherwise white shall not affect their classification as White Corn.

[2] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Mixed Corn (Class III)

This class shall consist of corn of various colors that does not meet the color requirements for either of the classes Yellow Corn or White Corn. White-capped yellow kernels shall be classified as Mixed Corn.

Grades.—Corn shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of its appropriate class, and according to the special grades when applicable.

Corn

Grade requirements for Yellow Corn, White Corn, and Mixed Corn

Grade No.	Minimum test weight per bushel	Maximum limits of—			
		Moisture	Cracked corn and foreign material	Damaged kernels	
				Total	Heat-damaged
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*
1	54	14.0	2	3	0.1
2	53	15.5	3	5	.2
3	51	17.5	4	7	.5
4	48	20.0	5	10	1.0
5	44	23.0	7	15	3.0
Sample grade	Sample grade shall include corn of the class Yellow Corn, or White Corn, or Mixed Corn, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive; or which contains stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor; or which is otherwise of distinctly low quality.				

Special Grades for Corn

Flint Corn

Definition.—Flint corn shall be corn of any class which consists of 95 percent or more of corn of any of the flint varieties.

Grades.—Flint corn shall be graded and designated according to the grade requirements of the standards applicable to such corn if it were not flint corn, and the word "Flint" shall be added to, and made a part of, the grade designation, immediately following the words Yellow Corn, or White Corn, or Mixed Corn, as the case may be.

Flint and Dent Corn

Definition.—Flint and Dent corn shall be corn of any class which consists of a mixture of the flint and dent varieties and which contains more than 5 percent but less than 95 percent of corn of any of the flint varieties.

Grades.—Flint and Dent corn shall be graded and designated according to the grade requirements of the standards applicable to such corn if it were not Flint and Dent corn, and the words "Flint and Dent" shall be added to, and made a part of, the grade designation, immediately following the words Yellow Corn, or White Corn, or Mixed Corn, as the case may be.

Weevily Corn

Definition.—Weevily corn shall be corn that is infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily corn shall be graded and designated according to the grade requirements of the standards applicable to such corn if it were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Definitions

Basis of grade determinations.—Each determination of class, variety, damage, and heat damage, shall be upon the basis of the grain after the removal of the cracked corn and foreign material. All other determinations shall be upon the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the water oven and the method of use thereof described in Service and Regulatory Announcements No.147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Cracked corn and foreign material.—Cracked corn and foreign material shall include kernels and pieces of kernels of corn and all matter other than corn which will pass through a No. 12 sieve, and all matter other than corn remaining on such sieve after screening.

No. 12 sieve.—A metal sieve perforated with round holes 12/64 inch in diameter.

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Other grains.—Other grains shall include wheat, rye, oats, grain sorghums, barley, hulless barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, sweet corn, pop corn, and soybeans.

Damaged kernels.—Damaged kernels shall be kernels and pieces of kernels of corn which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of corn which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR BARLEY[3]

For the purposes of the official grain standards of the United States for barley:

Barley.—Barley shall be any grain which, before the removal of dockage, consists of 50 percent or more of barley, and may contain not more than 25 percent of other grains for which standards have been established under the provisions of the United States Grain Standards Act. The term "barley" as used in these standards shall not include hull-less barley.

Classes.—Barley shall be divided into four classes, as follows: Class I, Barley; Class II, Black Barley; Class III, Western Barley; and Class IV, Mixed Barley.

Grades.—Barley shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of its appropriate class or subclass, and according to the special grades when applicable.

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[3] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Barley (Class I)

This class shall include all white (glumes) barley grown east of the Rocky Mountains, and may include not more than 10 percent of barley of other classes. This class shall be divided into two subclasses, as follows:

Subclass (A) Malting Barley

This subclass shall include 6-rowed barley of the class Barley (Class I) which meets the requirements of grades Nos. 1 to 3, inclusive, which, after the removal of dockage, contains not more than 5 percent of 2-rowed and/or other types or varieties of barley of unsuitable malting type such as Trebi and Black; which contains not more than 15 percent of barley and other matter that will pass through a 20-gage metal seive with slotted perforations 0.076 (47/64) of an inch wide and ¾ of an inch long; which contains not more than 5 percent of skinned and/or broken kernels; which contains not more than 4 percent of damaged barley; and shall not include Bleached barley. Barley of this subclass shall contain 75 percent or more of mellow barley kernels which kernels are not, en masse. semi-steely.

Subclass (B) Barley

This subclass shall include all barley of the class Barley which does not meet the requirements of subclass (A) Malting Barley.

Black Barley (Class II)

This class shall include all varieties of black (glumes) barley grown anywhere in the United States, and may include not more than 10 percent of barley of other classes.

Class I.—Barley and Class II.—Black Barley

Grade requirements for subclass (a) Malting Barley and subclass (b) Barley, of the class Barley, and for the class Black Barley

Grade No.	Minimum limits of—		Maximum limits of—			
	Test weight per bushel	Sound barley[1]	Heat-damaged kernels (barley, other grains, and wild oats)	Foreign material	Broken kernels	Black barley[2]
	Lbs.	*Pct.*	*Pct.*	*Pct.*	*Pct.*	*Pct.*
1[3]	47	95	0.1	1	4	0.5
2[3]	46	93	.2	2	8	1.0
3[3]	43	90	.5	3	12	2.0
4[4]	40	80	1.0	4	20	5.0
5	35	70	3.0	6	30	10.0
Sample grade	Sample grade shall include barley of the subclass Barley, or of the class Black Barley, which does not come within the grade requirements of any of the grades from No. 1 to No. 5, inclusive; or which contains more than 16 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.					

[1] Any barley in grade No. 1 that does not come within the provisions of the special grade Blighted, may contain not more than 2 percent of blight-damaged barley; and barley in any grade from No. 2 to Sample grade, inclusive, that does not come within the provisions of the special grade Blighted, may contain not more than 4 percent of blight-damaged barley. Any barley containing more than 4 percent of blight-damaged barley shall be graded No. 1, No. 2, No. 3, No. 4, No. 5, or Sample grade, Blighted, as the case may be, as provided in the specifications for Blighted barley.

[2] These specifications do not apply to the class Black Barley.

[3] See special requirements for subclass (A) Malting Barley.

[4] Barley that is badly stained or materially weathered, shall not be graded higher than No. 4.

Dockage

Dockage includes weed seeds, weed stems, chaff, straw, grain other than barley, sand, dirt, and any material other than barley, which can be removed readily from the barley by the use of a metal scalper riddle sieve with slotted perforations $\frac{9}{64}$ inch wide by $\frac{3}{4}$ inch long and by the use of a 20-gage metal sieve with equilateral triangular perforations the inscribed circles of which are $\frac{5}{64}$ inch in diameter; also undeveloped, shriveled, and small pieces of barley kernels removed in properly separating the foreign material and which cannot be recovered by properly rescreening or recleaning with the sieve having equilateral triangular perforations the inscribed circles of which are $\frac{5}{64}$ inch in diameter.

The quantity of dockage shall be calculated in terms of percentage based on the total weight of the grain including the dockage. The percentage of dockage, so calculated, when equal to 1 percent or more, shall be stated in terms of whole percent, and when less than 1 percent shall not be stated. A fraction of a percent shall be disregarded. The word "Dockage", together with the percentage thereof, shall be added to the grade designation.

Special Grades for Barley

Test Weight of Western Barley

Grades for test weight of Western Barley.— For barley of the class Western Barley, the test weight per bushel in terms of whole pounds shall be added to, and made a part of, the grade designation, following the name of the class. A fraction of a pound shall be disregarded.

Two-Rowed Barley

Definition.—Two-rowed barley shall consist of 2-rowed barley of the subclass Barley of the class Barley, or of the class Western Barley, and may contain not more than 10 percent of barley of other varieties.

Grades.—Two-rowed barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not 2-rowed, and there shall be added to, and made a part of, the grade designation, preceding the name of the class, the word "Two-rowed."

Tough Barley

Definition.—Tough barley shall be (a) barley of either of the classes Barley or Black Barley, or of the class Mixed Barley in which barley of either one of the classes Barley or Black Barley predominates, which contains more than 14.5 percent but not more than 16 percent of moisture, and (b) barley of the class Western Barley, or of the class Mixed Barley in which barley of the class Western Barley predominates, which contains more than 13.5 percent but not more than 15 percent of moisture.

Grades.—Tough barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

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Bright Western Barley

Definition.—Bright Western barley shall be barley of the class Western Barley, except Bleached barley, that is of good natural color.

Grades.—Bright Western barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not bright, and there shall be added to, and made a part of, the grade designation, preceding the name of the class, the word "Bright."

Stained Western Barley

Definition.—Stained Western barley shall be barley of the class Western Barley, except Bleached barley, that is badly stained or weathered.

Grades.—Stained Western barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not stained, and there shall be added to, and made a part of, the grade designation, the word "Stained."

Blighted Barley

Definition.— Blighted barley shall be all barley which contains more than 4 percent of barley damaged or materially discolored by blight and/or mold.

Grades.—Blighted barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not blighted, and there shall be added to, and made a part of, the grade designation, the word "Blighted."

Smutty Barley

Definition.—Smutty barley shall be barley which has the kernels covered with smut spores, or which contains smut masses in excess of 0.2 percent.

Grades.—Smutty barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Garlicky Barley

Definition.—Garlicky barley shall be barley which contains 3 or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 500 grams of barley.

Grades.—Garlicky barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not garlicky, and there shall be added to, and made a part of, the grade designation, the word "Garlicky."

Weevily Barley

Definition.—Weevily barley shall be barley which is infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Bright Western Barley

Definition.—Bright Western barley shall be barley of the class Western Barley, except Bleached barley, that is of good natural color.

Grades.—Bright Western barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not bright, and there shall be added to, and made a part of, the grade designation, preceding the name of the class, the word "Bright."

Stained Western Barley

Definition.—Stained Western barley shall be barley of the class Western Barley, except Bleached barley, that is badly stained or weathered.

Grades.—Stained Western barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not stained, and there shall be added to, and made a part of, the grade designation, the word "Stained."

Blighted Barley

Definition.— Blighted barley shall be all barley which contains more than 4 percent of barley damaged or materially discolored by blight and/or mold.

Grades.—Blighted barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not blighted, and there shall be added to, and made a part of, the grade designation, the word "Blighted."

Smutty Barley

Definition.—Smutty barley shall be barley which has the kernels covered with smut spores, or which contains smut masses in excess of 0.2 percent.

Grades.—Smutty barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Garlicky Barley

Definition.—Garlicky barley shall be barley which contains 3 or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 500 grams of barley.

Grades.—Garlicky barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not garlicky, and there shall be added to, and made a part of, the grade designation, the word "Garlicky."

Weevily Barley

Definition.—Weevily barley shall be barley which is infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Ergoty Barley

Definition.—Ergoty barley shall be barley which contains ergot in excess of 0.3 percent.

Grades.—Ergoty barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Bleached Barley

Definition.—Bleached barley shall be barley which, in whole or in part, has been treated by the use of sulphurous acid or any other bleaching agent.

Grades.—Bleached barley shall be graded and designated according to the grade requirements of the standards applicable to such barley if it were not bleached, and there shall be added to, and made a part of, the grade designation, the word "Bleached."

Definitions

Basis of grade determinations.—Each determination of dockage, temperature, odor, garlic, and live weevils or other insects injurious to stored grain, shall be upon the basis of the grain as a whole. Each determination of heat-damaged kernels and of mellow barley kernels shall be upon the basis of the pearled dockage-free grain. All other determinations shall be upon the basis of the grain when free from dockage.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the

Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel, as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter other than barley, except other grains, wild oats, and smut masses, which is not separated from the barley in the proper determination of dockage.

Other grains.—Other grains shall include wheat, rye, oats, corn, grain sorghums, hull-less barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Sound barley.—Sound barley shall be kernels and pieces of kernels of barley remaining after the removal of dockage, which are not damaged or materially discolored by blight and/or mold, which are not heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Damaged barley.—Damaged barley shall be kernels and pieces of kernels of barley which are damaged or materially discolored by blight and/or mold, or which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of barley, other grains, and wild oats, which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR OATS [4]

For the purposes of the official grain standards of the United States for oats:

Oats.—Oats shall be any grain which consists of 80 percent or more of cultivated oats. Oats may contain not more than 10 percent of wild oats.

Classes.—Oats shall be divided into five classes as follows: Class I, White Oats; Class II, Red Oats; Class III, Gray Oats; Class IV, Black Oats; and Class V, Mixed Oats. For the purpose of this classification, the characteristics of each class, except Mixed Oats, shall be based on color characteristics; White Oats shall include yellow oats; and tinges of white, brown, or black, on the kernels of any red oats variety shall not affect their classification as red oats. Oats of any class except Mixed Oats may include not more than 10 percent of cultivated oats of other classes. Mixed Oats shall be any mixture of oats which does not meet the requirements for any one of the classes White Oats, Red Oats, Gray Oats, or Black Oats.

Grades.—Oats shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of their appropriate class, and according to the special grades when applicable.

Special Grades for Oats

Bright Oats

Definition.—Bright oats shall be oats, except Bleached oats, that are of good natural color.

Grades.—Bright oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not bright, and there shall be added to, and made a part of, the grade designation, preceding the name of the class, the word "Bright."

[4] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Oats

Grade requirements for the classes White Oats, Red Oats, Gray Oats, Black Oats, and Mixed Oats

Grade No.	Minimum limits of—		Maximum limits of—		
	Test weight per bushel	Sound cultivated oats	Heat-damaged kernels (oats, other grains, and wild oats)	Foreign material	Wild oats
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*
1 [1]	32	97	0.1	2	2
2 [2]	30	94	.3	3	3
3 [3]	27	90	1.0	4	5
4 [4]	24	80	3.0	5	10
Sample grade.	Sample grade shall include oats of any one of the classes White Oats, Red Oats, Gray Oats, Black Oats, or Mixed Oats, which do not come within the requirements of any of the grades from No. 1 to No. 4, inclusive; or which contain more than 16 percent of moisture; or which contain stones and/or cinders; or which are musty, or sour, or heating, or hot; or which have any commercially objectionable foreign odor except of smut or garlic; or which contain seeds of wild brome grasses of a character and in a quantity sufficient to cause the grain to be of low quality for feeding purposes; or which are otherwise of distinctly low quality.				

[1] The oats in grade No. 1 White Oats may contain not more than 5 percent of oats of other classes, of which not more than 3 percent may be black cultivated oats.

[2] The oats in grade No. 2 White Oats may contain not more than 5 percent of black cultivated oats.

[3] Oats that are slightly weathered shall not be graded higher than No. 3.

[4] Oats that are badly stained or materially weathered shall not be graded higher than No. 4.

Special Red Oats

Definition.—Special red oats shall be oats of the class Red Oats which consist of Columbia oats or other red oats having similar character-

istics and may contain not more than 10 percent of other cultivated oats.

Grades.—Special red oats shall be graded and designated according to the grade requirements of the standards applicable to such red oats if they were not special, and there shall be added to, and made a part of, the grade designation, immediately preceding the name of the class, the word "Special."

Medium Heavy Oats

Definition.—Medium heavy oats shall be oats of any class of grades Nos. 3, 4, and Sample grade which have a test weight per bushel of 30 pounds or more but less than 35 pounds.

Grades.—Medium heavy oats shall be graded and designated according to the grade requirements of the standards otherwise applicable and there shall be added to, and made a part of, the grade designation, preceding the name of the class, the words "Medium Heavy."

Heavy Oats

Definition.—Heavy oats shall be oats which have a test weight per bushel of 35 pounds or more but less than 38 pounds.

Grades.—Heavy oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not heavy, and there shall be added to, and made a part of, the grade designation, preceding the name of the class, the word "Heavy."

Extra Heavy Oats

Definition.—Extra Heavy oats shall be oats which have a test weight per bushel of 38 pounds or more.

Grades.—Extra Heavy oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not extra heavy, and there shall be

added to, and made a part of, the grade designation, preceding the name of the class, the words "Extra Heavy."

Tough Oats

Definition.—Tough oats shall be oats which contain more than 14.5 percent but not more than 16 percent of moisture.

Grades.—Tough oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

Thin Oats

Definition.—Thin oats shall be any oats, whether sized, clipped, or natural, which contain more than 20 percent of oats and/or other matter except "fine seeds" that will pass through a 20-gage metal sieve with slotted perforations 0.064 inch wide by ⅜ inch long.

Grades.—Thin oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not "thin" oats, and there shall be added to, and made a part of, the grade designation, the word "Thin."

Bleached Oats

Definition.—Bleached oats shall be oats which, in whole or in part, have been treated by the use of sulphurous acid or any other bleaching agent.

Grades.—Bleached oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not bleached, and there shall be added to, and made a part of, the grade designation, the word "Bleached."

Weevily Oats

Definition.—Weevily oats shall be oats which are infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Smutty Oats

Definition.—Smutty oats shall be oats which have the kernels covered with smut spores, or which contain smut masses and/or smut balls in excess of 0.2 percent.

Grades.—Smutty oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Ergoty Oats

Definition.—Ergoty oats shall be oats which contain ergot in excess of 0.3 percent.

Grades.—Ergoty oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Garlicky Oats

Definition.—Garlicky oats shall be oats which contain 4 or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 500 grams of oats.

Grades.—Garlicky oats shall be graded and designated according to the grade requirements of the standards applicable to such oats if they were not garlicky, and there shall be added to, and made a part of, the grade designation, the word "Garlicky."

Definitions

Basis of grade determinations.—All determinations shall be upon the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter except kernels and pieces of kernels of cultivated oats, other grains, and wild oats, but shall include oats clippings and detached hulls.

Fine seeds.—Fine seeds shall include all matter which can be removed from oats by the use of a metal sieve perforated with equilateral triangular perforations the inscribed circles of which are 5/64 inch in diameter.

Other grains.—Other grains shall include wheat, rye, corn, grain sorghums, barley, hulless barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Sound cultivated oats.—Sound cultivated oats shall be all kernels and pieces of kernels of cultivated oats which are not heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of cultivated oats, other grains, and wild oats which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR FEED OATS [5]

For the purposes of the official grain standards of the United States for Feed Oats:

Feed Oats.—Feed Oats shall be any grain which consists of either (a) 30 percent or more but less than 80 percent of cultivated oats, but not less than 65 percent of cultivated and wild oats combined, or (b) 80 percent or more of cultivated oats and more than 10 percent of wild oats. Feed Oats may contain not more than 25 percent of other grains, and may contain not more than 10 percent of foreign material, which 10 percent may include not more than 5 percent of fine seeds.

Grades.—Feed Oats shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of these standards, and according to the special grades when applicable.

Special Grades for Feed Oats

Tough Feed Oats

Definition.—Tough Feed Oats shall be feed oats which contain more than 14.5 percent but not more than 16 percent of moisture.

Grades.—Tough Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such feed oats if they were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

[5] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Feed Oats

Grade requirements for Feed Oats

Grade No.	Minimum limits of—		Maximum limits of—		
	Test weight per bushel	Cultivated oats	Heat-damaged kernels (oats, wild oats, and other grains)	Foreign material	
				Total	Fine seeds
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*
1	32	60	2	3	2
2	29	45	4	4	3
3[1]	26	30	6	6	4
Sample grade	Sample grade shall include feed oats which do not come within the requirements of any of the grades from No. 1 to No. 3, inclusive; or which contain more than 16 percent of moisture; or which are musty, or sour, or heating, or hot; or which have any commercially objectionable foreign odor except of smut or garlic; or which contain seeds of wild brome grasses of a character and in a quantity sufficient to cause the grain to be of low quality for feeding purposes; or which are otherwise of distinctly low quality.				

[1] Feed Oats that are badly stained or materially weathered shall not be graded higher than No. 3.

Bleached Feed Oats

Definition.—Bleached Feed Oats shall be feed oats which, in whole or in part, have been treated by the use of sulphurous acid or any other bleaching agent.

Grades.—Bleached Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such feed oats if they were not bleached, and there shall be added to, and made a part of, the grade designation, the word "Bleached."

Weevily Feed Oats

Definition.—Weevily Feed Oats shall be feed oats which are infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such feed oats if they were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Smutty Feed Oats

Definition.—Smutty Feed Oats shall be feed oats which have the kernels covered with smut spores, or which contain smut masses and/or smut balls in excess of 0.2 percent.

Grades.—Smutty Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such feed oats if they were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Ergoty Feed Oats

Definition.—Ergoty Feed Oats shall be feed oats which contain ergot in excess of 0.3 percent.

Grades.—Ergoty Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such feed oats if they were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Definitions

Basis of grade determinations.—All determinations shall be upon the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter except kernels and pieces of kernels of cultivated oats, other grains, and wild oats; but shall include oats clippings and detached hulls.

Fine seeds.—Fine seeds shall include all matter which can be removed from feed oats by the use of a metal sieve perforated with equilateral triangular perforations the inscribed circles of which are 5/64 inch in diameter.

Other grains.—Other grains shall include wheat, rye, corn, grain sorghums, barley, hulless barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of cultivated oats, wild oats, and other grains which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR MIXED FEED OATS [6]

For the purposes of the official grain standards of the United States for Mixed Feed Oats:

Mixed Feed Oats.—Mixed Feed Oats shall be any grain which consists of less than 30 percent of cultivated oats, but either (a) not less than 65 percent of cultivated and wild oats combined, or (b) not less than 65 percent of wild oats; may contain not more than 25 percent of other grains; and may contain not more than 10 percent of foreign material, which 10 percent may include not more than 5 percent of fine seeds.

Grades.—Mixed Feed Oats shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of these standards, and according to the special grades when applicable.

Special Grades for Mixed Feed Oats

Tough Mixed Feed Oats

Definition.—Tough Mixed Feed Oats shall be mixed feed oats which contain more than 14.5 percent but not more than 16 percent of moisture.

Grades.—Tough Mixed Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such mixed feed oats if they were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

Bleached Mixed Feed Oats

Definition.—Bleached Mixed Feed Oats shall be mixed feed oats which, in whole or in part,

[6] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

have been treated by the use of sulphurous acid or any other bleaching agent.

Grades.—Bleached Mixed Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such mixed feed oats if they were not bleached, and there shall be added to, and made a part of, the grade designation, the word "Bleached."

Mixed Feed Oats

Grade requirements for Mixed Feed Oats

Grade No.	Minimum test weight per bushel	Maximum limits of—		
		Heat-damaged kernels (oats, wild oats, and other grains)	Foreign material	
			Total	Fine seeds
	Pounds	*Percent*	*Percent*	*Percent*
1	32	2	5	2
2	29	4	7	3
3 [1]	26	6	10	4
Sample grade	Sample grade shall include mixed feed oats which do not come within the requirements of any of the grades from No. 1 to No. 3, inclusive; or which contain more than 16 percent of moisture; or which are musty, or sour, or heating, or hot; or which have any commercially objectionable foreign odor except of smut or garlic; or which contain seeds of wild brome grasses of a character and in a quantity sufficient to cause the grain to be of low quality for feeding purposes; or which are otherwise of distinctly low quality.			

[1] Mixed Feed Oats that are badly stained or materially weathered shall not be graded higher than No. 3.

Weevily Mixed Feed Oats

Definition.—Weevily Mixed Feed Oats shall be mixed feed oats which are infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily Mixed Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such mixed feed oats if they were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Smutty Mixed Feed Oats

Definition.—Smutty Mixed Feed Oats shall be mixed feed oats which have the kernels covered with smut spores, or which contain smut masses and/or smut balls in excess of 0.2 percent.

Grades.—Smutty Mixed Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such mixed feed oats if they were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Ergoty Mixed Feed Oats

Definition.—Ergoty Mixed Feed Oats shall be mixed feed oats which contain ergot in excess of 0.3 percent.

Grades.—Ergoty Mixed Feed Oats shall be graded and designated according to the grade requirements of the standards applicable to such mixed feed oats if they were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Definitions

Basis of grade determinations.—All determinations shall be upon the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter except kernels and pieces of kernels of cultivated oats, other grains, and wild oats; and shall include oats clippings and detached hulls.

Fine seeds.—Fine seeds shall include all matter which can be removed from Mixed Feed Oats by the use of a metal sieve perforated with equilateral triangular perforations the inscribed circles of which are 5/64 inch in diameter.

Other grains.—Other grains shall include wheat, rye, corn, grain sorghums, barley, hulless barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of cultivated oats, wild oats, or other grains, which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR RYE [7]

For the purposes of the official grain standards of the United States for rye:

Rye.—Rye shall be any grain which, before the removal of dockage, consists of 50 percent or more of rye and not more than 10 percent of other grains for which standards have been established under the provisions of the United States Grain Standards Act.

Grades.—Rye shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of these standards, and according to the special grades when applicable.

Dockage

Dockage includes weed seeds, weed stems, chaff, straw, grain other than rye, sand, dirt, and any other foreign material, which can be removed readily from the rye by the use of appropriate sieves and cleaning devices; also undeveloped, shriveled, and small pieces of rye kernels which are removed in properly separating the foreign material, and which cannot be recovered by properly rescreening or recleaning.

The quantity of dockage shall be calculated in terms of percentage based on the total weight of the grain including the dockage. The percentage of dockage so calculated, when equal to 1 percent or more, shall be stated in terms of whole percent, and when less than 1 percent shall not be stated. A fraction of a percent shall be disregarded. The word "Dockage", together with the percentage thereof, shall be added to the grade designation.

[7] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Rye

Grade requirements for Rye

Grade No.	Minimum test weight per bushel	Maximum limits of—			
		Damaged kernels (rye and other grains)		Foreign material	
		Total	Heat-damaged	Total	Foreign matter other than wheat
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*
1 [1]	56	2	0.1	3	1
2 [1]	54	4	.2	6	2
3 [1]	52	7	.5	10	4
4	49	15	3.0	10	6
Sample grade	Sample grade shall include rye which does not come within the requirements of any of the grades from No. 1 to No. 4, inclusive; or which contains more than 16 percent of moisture; or which contains inseparable stones and/or cinders; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor except of smut or garlic; or which contains a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.				

[1] The rye in grades No. 1 and No. 2 may contain not more than 20 percent, and the rye in grade No. 3 may contain not more than 30 percent, of rye and other matter that will pass through a 20-gage metal sieve with rectangular perforations 0.064 inch wide by ⅜ inch long.

Special Grades for Rye

Plump Rye

Definition.—Plump rye shall be rye which does not contain more than 5 percent of rye and other matter that will pass through a 20-gage metal sieve with rectangular perforations 0.064 inch wide by ⅜ inch long.

Grades.—Plump rye shall be graded and designated according to the grade requirements of the standards applicable to such rye if it were not plump, and there shall be added to, and made a part of, the grade designation, immediately preceding the word rye, the word "Plump."

Tough Rye

Definition.—Tough rye shall be rye which contains more than 14 percent but not more than 16 percent of moisture.

Grades.—Tough rye shall be graded and designated according to the grade requirements of the standards applicable to such rye if it were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

Smutty Rye

Definition.—Smutty rye shall be rye which has an unmistakable odor of smut, or which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 14 balls of average size in 250 grams of rye.

Grades.—Smutty rye shall be graded and designated according to the grade requirements of the standards applicable to such rye if it were not smutty; and

(1) In the case of smutty rye which has an unmistakable odor of smut, or which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 14 balls but not in excess of a quantity equal to 30 balls of aver-

age size in 250 grams of rye, there shall be added to, and made a part of, the grade designation, the words "Light Smutty"; and

(2) In the case of smutty rye which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 30 balls of average size in 250 grams of rye, there shall be added to, and made a part of, the grade designation, the word "Smutty."

Garlicky Rye

Definition.—Garlicky rye shall be rye which contains 2 or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of rye.

Grades.—Garlicky rye shall be graded and designated according to the grade requirements of the standards applicable to such rye if it were not garlicky; and

(1) In the case of garlicky rye which contains 2 or more but not more than 6 green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of rye, there shall be added to, and made a part of, the grade designation, the words "Light Garlicky"; and

(2) In the case of garlicky rye which contains more than 6 green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of rye, there shall be added to, and made a part of, the grade designation, the word "Garlicky."

Weevily Rye

Definition.—Weevily rye shall be rye which is infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily rye shall be graded and designated according to the grade requirements of the standards applicable to such rye if it were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Ergoty Rye

Definition.—Ergoty rye shall be rye which contains ergot in excess of 0.3 percent.

Grades.—Ergoty rye shall be graded and designated according to the grade requirements of the standards applicable to such rye if it were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Definitions

Basis of grade determinations.—Each determination of dockage, temperature, odor, garlic, and live weevils or other insects injurious to stored grain, shall be upon the basis of the grain as a whole. All other determinations shall be upon the basis of the grain when free from dockage.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter other than rye which is not separated from the rye in the proper determination of dockage, except that smut balls shall not be considered as foreign material.

Other grains.—Other grains shall include wheat, oats, corn, grain sorghums, barley, hulless barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Damaged kernels.—Damaged kernels shall be kernels and pieces of kernels of rye and other grains which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of rye and other grains which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR GRAIN SORGHUMS[8]

For the purposes of the official grain standards of the United States for grain sorghums:

Grain sorghums.—Grain sorghums shall be any grain which, before the removal of dockage, consists of 50 percent or more of grain sorghums and not more than 10 percent of other grains for which standards have been established under the provisions of the United States Grain Standards Act, and which, after the removal of dockage and of "cracked kernels, foreign material, and other grains", contains not more than 25 percent of nongrain sorghums.

Classes.—Grain sorghums shall be divided into five classes, as follows: Class I, White Grain Sorghums; Class II, Yellow Grain Sorghums; Class III, Red Grain Sorghums; Class IV, Brown Grain Sorghums; and Class V, Mixed Grain Sorghums.

Grades.—Grain sorghums shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of their appropriate class or subclass, and according to the special grades when applicable.

[8] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Grain Sorghums

Grade requirements for Grain Sorghums

Grade No.	Minimum test weight per bushel	Maximum limits of—				
		Moisture	Damaged kernels (grain sorghums, nongrain sorghums, and other grains)		Nongrain sorghums	Total cracked kernels, foreign material, and other grains
			Total	Heat-damaged		
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1	55	14	2	0.2	1	4
2	53	15	5	.5	3	8
3	51	16	10	1.0	5	12
4	49	18	15	3.0	10	15
Sample grade	Sample grade shall include grain sorghums of any class or subclass which do not come within the requirements of any of the grades from No. 1 to No. 4, inclusive; or which contain inseparable stones and/or cinders; or which are musty, or sour, or heating, or hot; or which are badly weathered; or which have any commercially objectionable foreign odor except of smut; or which are otherwise of distinctly low quality.					

White Grain Sorghums (Class I)

This class shall include all varieties of white grain sorghums, and may include not more than 10 percent of grain sorghums of other colors. Colored spots upon kernels that are otherwise white shall not affect their classification as white. This class shall be divided into three subclasses, as follows:

Subclass (A) White Kafir

This subclass shall include grain sorghums of the white kafir type, including hegari, and may include not more than 10 percent of other white grain sorghums, grain sorghums of other colors, or nongrain sorghums of other colors, singly or in any combination.

Subclass (B) White Durra

This subclass shall include grain sorghums of the white durra type, and may include not more than 10 percent of other white grain sorghums, grain sorghums of other colors, or nongrain sorghums of other colors, singly or in any combination.

Subclass (C) White Grain Sorghums

This subclass shall include all grain sorghums of the class White Grain Sorghums not coming within the classification for subclass (a) White Kafir or subclass (b) White Durra.

Yellow Grain Sorghums (Class II)

This class shall include all varieties of yellow and salmon-pink grain sorghums, and may include not more than 10 percent of grain sorghums of other colors. This class shall be divided into two subclasses, as follows:

Subclass (A) Yellow Milo

This subclass shall include grain sorghums of the yellow milo type, and may include not more than 10 percent of other yellow grain sorghums, grain sorghums of other colors, or nongrain sorghums of other colors, singly or in any combination.

Subclass (B) Yellow Grain Sorghums

This subclass shall include all grain sorghums of the class Yellow Grain Sorghums not coming within the classification for subclass (a) Yellow Milo.

Red Grain Sorghums (Class III)

This class shall include all varieties of red grain sorghums, and may include not more than 10 percent of grain sorghums of other colors. This class shall be divided into two subclasses, as follows:

Subclass (A) Red Kafir

This subclass shall include grain sorghums of the red kafir type and may include not more than 10 percent of other red grain sorghums, grain sorghums of other colors, or nongrain sorghums of other colors, singly or in any combination.

Subclass (B) Red Grain Sorghums

This subclass shall include all grain sorghums of the class Red Grain Sorghums not coming within the classification for subclass (a) Red Kafir.

Brown Grain Sorghums (Class IV)

This class shall include all varieties of brown grain sorghums, and may include not more than 10 percent of grain sorghums of other colors.

Mixed Grain Sorghums (Class V)

This class shall include all mixtures of grain sorghums not provided for in the classes from I to IV, inclusive.

Grade requirements and designations.—The grade designation for Mixed Grain Sorghums shall include, successively, in the order named: (1) The number of the grade or the words "Sample grade", as the case may be; (2) the words "Mixed Grain Sorghums"; (3) the name and the approximate percentage of each class of grain sorghums which constitutes 10 percent or more of the mixture, in the order of its predominance, but if only one class exceeds 10 percent of the mixture, the name and approximate percentage of that class shall be included in the grade designation, followed by the name and approximate percentage of at least one other class. In those cases where Mixed Grain Sorghums consist of 70 percent or more of grain sorghums of the types white kafir, white durra, yellow milo, or red kafir, singly or combined, and not more than 10 percent of brown grain sorghums, the word "Mixed" shall be substituted for the words "Mixed Grain Sorghums", and the name of the appropriate subclass or subclasses for such type or types, as the case may be, shall be substituted for the class names, in the grade designation.

Dockage

Dockage includes sand, dirt, finely broken kernels, weed seeds, and other foreign material, which can be removed readily from the grain sorghums by means of a metal sieve perforated with round holes 2½/64 inch in diameter. The quantity of dockage shall be calculated in terms of percentage based on the total weight of the grain including the dockage.

Dockage shall be stated in terms of whole percent. A fraction of a percent shall be disregarded. The word "Dockage", together with the percentage thereof, shall be added to the grade designation.

Special Grades for Grain Sorghums

Bright Grain Sorghums

Definition.—Bright grain sorghums shall be grain sorghums, of any class or subclass, which have good, natural color.

Grades.—Bright grain sorghums shall be graded and designated according to the grade requirements of the standards applicable to such grain sorghums if they were not bright, and there shall be added to, and made a part of, the grade designation, preceding the name of the class or subclass, the word "Bright."

Discolored Grain Sorghums

Definition.—Discolored grain sorghums shall be grain sorghums of any class or subclass which are discolored, but which are not badly weathered.

Grades.—Discolored grain sorghums shall be graded and designated according to the grade requirements of the standards applicable to such grain sorghums if they were not discolored, and there shall be added to, and made a part of, the grade designation, the word "Discolored."

Weevily Grain Sorghums

Definition.—Weevily grain sorghums shall be grain sorghums which are infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily grain sorghums shall be graded and designated according to the grade requirements of the standards applicable to such grain sorghums if they were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Smutty Grain Sorghums

Definition.—Smutty grain sorghums shall be grain sorghums which have the kernels covered with smut spores, or which contain a quantity of smut masses in excess of a quantity equal to 10 masses in 50 grams of grain sorghums.

Grades.—Smutty grain sorghums shall be graded and designated according to the grade requirements of the standards applicable to such grain sorghums if they were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Definitions

Basis of grade determinations.—Each determination of "cracked kernels, foreign material, and other grains", shall be upon the basis of the grain when free from dockage. Each determination of class, subclass, nongrain sorghums, damage, heat damage, and inseparable stones and/or cinders, shall be upon the basis of the grain when free from dockage and when free from that part of the "cracked kernels, foreign material, and other grains" which can be removed readily by the use of a metal sieve perforated with equilateral triangular perforations the inscribed circles of which are 5/64 inch in diameter. All other determinations shall be upon the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Other grains.—Other grains shall include wheat, rye, oats, corn, barley, hull-less barley, flaxseed, emmer, spelt, einkorn, Polish wheat, poulard wheat, cultivated buckwheat, and soybeans.

Nongrain sorghums.—Nongrain sorghums shall include broomcorn, Sudan grass, Johnson grass, and cane seed.

Cracked kernels, foreign material, and other grains.—Cracked kernels, foreign material, and other grains, shall include kernels and pieces of kernels of grain sorghums, and all other matter except dockage that will pass through a metal sieve perforated with equilateral triangular perforations the inscribed circles of which are 5/64 inch in diameter; also other grains and all other matter except grain sorghums and nongrain sorghums remaining on such sieve after screening.

Damaged kernels.—Damaged kernels shall be kernels and pieces of kernels of grain sorghums, nongrain sorghums, and other grains which are heat damaged, sprouted, frosted, badly ground damaged, moldy, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of grain sorghums, nongrain sorghums, and other grains which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

STANDARDS FOR FLAXSEED[9]

For the purposes of the official grain standards of the United States for flaxseed:

Flaxseed.—Flaxseed shall be any grain which, before the removal of dockage, consists of 50 percent or more of flaxseed and not more than 20 percent of other grains for which standards have been established under the provisions of the United States Grain Standards Act.

Grades.—Flaxseed shall be graded and designated according to the respective grade requirements of the numerical grades and Sample grade of these standards.

Flaxseed

Grade requirements for Flaxseed

Grade No.	Minimum test weight per bushel	Maximum limits of damaged flaxseed
1	49 pounds	20 percent
2	47 pounds	30 percent
Sample grade	Sample grade shall include flaxseed which does not come within the requirements of either of the grades No. 1 or No. 2; or which contains fire-damaged flaxseed; or which contains more than 11 percent of moisture; or which is musty, or sour, or heating, or hot; or which has any commercially objectionable foreign odor; or which is otherwise of distinctly low quality.	

[9] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Dockage

Dockage shall include all matter other than flaxseed which is contained in the lot of grain as a whole; also undeveloped, shriveled, and small pieces of flaxseed removed with the dockage and which cannot be recovered by properly rescreening or recleaning. The quantity of dockage shall be calculated in terms of percentage based on the total weight of the flaxseed including the dockage.

Dockage shall be stated in terms of whole percent. A fraction of a percent shall be disregarded. The word "Dockage", together with the percentage thereof, shall be added to the grade designation.

Definitions

Basis of grade determinations.—Each determination of test weight, moisture, damage, and "fire damaged", shall be upon the basis of the grain after the removal of that part of the dockage which can be removed readily by the use of appropriate sieves and cleaning devices. All other determinations shall be upon the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results in the determination of moisture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Damaged flaxseed.—Damaged flaxseed shall be seeds and pieces of seeds of flaxseed which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

STANDARDS FOR SOYBEANS[10]

Terms Defined

For the purposes of the official grain standards of the United States for soybeans:

(a) **Soybeans.**—Soybeans shall be any grain which consists of 50 percent or more of threshed soybeans and not more than 10.0 percent of other grains. Threshed soybeans shall be whole or broken soybeans which are not removed in the determination of foreign material.

(b) **Classes.**—Soybeans shall be divided into the following five classes: Yellow Soybeans, Green Soybeans, Brown Soybeans, Black Soybeans, and Mixed Soybeans.

(c) **Yellow Soybeans.**—Yellow Soybeans shall be any soybeans with yellow or green seed coats, which in cross section are yellow or have a yellow tinge, and may include not more than 10.0 percent of soybeans of other classes.

(d) **Green Soybeans.**—Green Soybeans shall be any soybeans with green seed coats which in cross section are green, and may include not more than 10.0 percent of soybeans of other classes.

(e) **Brown Soybeans.**—Brown Soybeans shall be any soybeans with brown seed coats, and may include not more than 10.0 percent of soybeans of other classes.

(f) **Black Soybeans.**—Black Soybeans shall be any soybeans with black seed coats, and may include not more than 10.0 percent of soybeans of other classes.

(g) **Mixed Soybeans.**—Mixed Soybeans shall be any mixture of soybeans which does not meet

[10] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

the requirements for the classes Yellow Soybeans, Green Soybeans, Brown Soybeans, or Black Soybeans. Bicolored soybeans shall be classified as Mixed Soybeans.

(h) **Grades and grade designations.**—Grades shall be the numerical grades, sample grade, and special grades provided for on pages 71–72.

(i) **Bicolored soybeans.**—Bicolored soybeans shall be any soybeans with seed coats of two colors, one of which is black or brown.

(j) **Splits.**—Splits shall be pieces of soybeans.

(k) **Damaged kernels.**—Damaged kernels shall be soybeans, pieces of soybeans, and kernels and pieces of kernels of other grains which are heat-damaged, sprouted, frosted, badly ground-damaged, badly weather-damaged, moldy, diseased, or otherwise materially damaged.

(l) **Other grains.**—Other grains shall be barley, corn, flaxseed, grain sorghums, oats, rye, wheat, buckwheat, einkorn, emmer, Polish wheat, popcorn, poulard wheat, rice, spelt, sweet corn, and wild oats.

(m) **Foreign material.**—Foreign material shall be all matter, including soybeans and pieces of soybeans, which will pass readily through a sieve 0.032 inch thick with round perforations 0.125 (⅛) inch in diameter, and all matter other than soybeans remaining on such sieve after sieving.

(n) **Stones.**—Stones shall be concreted earthy or mineral matter and other substances of similar hardness that do not disintegrate readily in water.

Principles Governing Application of Standards

The following principles shall apply in the determination of the classes and grades of soybeans:

(a) **Basis of determinations.**—Each determination of class, splits, and damaged kernels

shall be upon the basis of the grain when free from that part of foreign material which can be removed readily by the use of a sieve 0.032 inch thick with round perforations 0.125 (8/64) inch in diameter. All other determinations shall be upon the basis of the grain as a whole.

(b) **Percentages.**—Percentages shall be upon the basis of weight.

(c) **Percentage of moisture.**—Percentage of moisture shall be ascertained by the air oven and the method of use thereof described in Service and Regulatory Announcements No. 147 (revised August 1941), issued by the Agricultural Marketing Service (now Production and Marketing Administration) of the United States Department of Agriculture, or ascertained by any device and method which give equivalent results.

(d) **Percentage of splits.**—The percentage of splits shall be expressed in whole percent and any fraction of a percent shall be disregarded.

(e) **Test weight per bushel.**—Test weight per bushel shall be the weight per Winchester bushel, as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results.

Grade Requirements

The following grade requirements are applicable under these standards:

(a) Numerical grades, sample grade, and grade requirements for all classes of soybeans.

Grade	Minimum test weight per bushel	Maximum limits of—			
		Moisture	Splits	Damaged kernels (soybeans and other grains)	Foreign material
	Pounds	*Percent*	*Percent*	*Percent*	*Percent*
No. 1 [1]	56	13.0	10	2.0	2.0
No. 2 [1]	54	14.0	20	3.0	3.0
No. 3 [1]	52	16.0	30	5.0	4.0
No. 4 [2]	49	18.0	40	8.0	6.0
Sample grade	Sample grade shall be soybeans which do not meet the requirements for any of the grades from No. 1 to No. 4, inclusive; or which are musty, or sour, or heating; or which have any commercially objectionable foreign odor; or which contain stones; or which are otherwise of distinctly low quality.				

[1] The soybeans in grade No. 1 of the class Yellow Soybeans may contain not more than 1.0 percent, in grade No. 2 not more than 2.0 percent, and in grade No. 3 not more than 5.0 percent of Green, Black, Brown, or bicolored soybeans, either singly or in any combination.

[2] Soybeans which are materially weathered shall not be graded higher than No. 4.

(b) Special grades, special grade requirements, and special grade designations for all classes of soybeans—(1) *Garlicky soybeans*—(i) *Requirements.*—Garlicky soybeans shall be soybeans which contain 5 or more garlic bulblets in 1,000 grams of soybeans.

(ii) *Grade designation.*—Garlicky soybeans shall be graded and designated according to the grade requirements of the standards applicable to such soybeans if they were not garlicky, and there shall be added to and made a part of the grade designation the word "Garlicky."

(2) *Weevily soybeans*—(i) *Requirements.*—Weevily soybeans shall be soybeans which are infested with live weevils or other live insects injurious to stored grain.

(ii) *Grade designation.*—Weevily soybeans shall be graded and designated according to the grade requirements of the standards applicable to such soybeans if they were not weevily, and there shall be added to and made a part of the grade designation the word "Weevily."

STANDARDS FOR MIXED GRAIN [11]

For the purposes of the official grain standards of the United States for Mixed Grain:

Definition.—Mixed Grain shall be any mixture of those grains for which standards have been, or hereafter may be, established under the provisions of the United States Grain Standards Act, that does not come within the requirements of any of the standards for such grains, and that does not contain more than 50 percent of foreign material. Wild oats in Mixed Grain shall be classed as a grain.

Grades.—Mixed Grain shall be graded and designated either as "Mixed Grain" or as "Sample grade Mixed Grain", and according to the special grades when applicable.

Grade Requirements

Mixed Grain (Grade).—The grade "Mixed Grain" shall include all mixed grain which does not come within the specifications for Sample grade Mixed Grain.

Sample grade Mixed Grain.—The grade "Sample grade Mixed Grain" shall include all mixed grain which contains more than 16 percent of moisture, or more than 15 percent of damaged kernels, or more than 3 percent of heat-damaged kernels; or which is musty, or sour, or heating, or hot; or which contains stones and/or cinders; or which has any commercially objectionable foreign odor except of smut or garlic; or which has a quantity of smut so great that any one or more of the grade requirements cannot be applied accurately; or which is otherwise of distinctly low quality.

[11] The specifications of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

Grade Designations

The grade designation for Mixed Grain shall include, in the order named:

(1) The words "Mixed Grain" or the words "Sample grade Mixed Grain", as the case may be;

(2) The name and approximate percentage of each kind of grain, including wild oats, which constitutes 10 percent or more of the mixture, in the order of predominance; and

(3) When applicable, the words "Other Grains", followed by a statement of the percentage of the combined quantity of those kinds of grain, including wild oats, each of which is present in a quantity less than 10 percent; and

(4) The words "Foreign Material", together with a statement of the percentage thereof.

All percentage statements shall be in terms of whole percent. A fraction of a percent shall be disregarded.

Special Grades for Mixed Grain

Tough Mixed Grain

Definition.—Tough Mixed Grain shall be mixed grain which contains more than 14.5 percent but not more than 16 percent of moisture.

Grades.—Tough Mixed Grain shall be graded and designated according to the grade requirements of the standards applicable to such mixed grain if it were not tough, and there shall be added to, and made a part of, the grade designation, the word "Tough."

Smutty Mixed Grain

Definition.—Smutty Mixed Grain shall be (a) mixed grain in which wheat or rye predominates, and which contains balls, portions of balls, or spores, of smut, in excess of a quantity equal to 14 balls of average size in 250 grams of mixed grain, or (b) any other mixed grain which has the kernels covered with smut spores, or which contains smut masses and/or smut balls in excess of 0.2 percent.

Grades.—Smutty Mixed Grain shall be graded and designated according to the grade requirements of the standards applicable to such mixed grain if it were not smutty, and there shall be added to, and made a part of, the grade designation, the word "Smutty."

Ergoty Mixed Grain

Definition.—Ergoty Mixed Grain shall be mixed grain which contains ergot in excess of 0.3 percent.

Grades.—Ergoty Mixed Grain shall be graded and designated according to the grade requirements of the standards applicable to such mixed grain if it were not ergoty, and there shall be added to, and made a part of, the grade designation, the word "Ergoty."

Garlicky Mixed Grain

Definition.—Garlicky Mixed Grain shall be (a) mixed grain in which wheat or rye predominates, and which contains 2 or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 1,000 grams of mixed grain; or (b) mixed grain in which oats or barley predominates, and which contains 4 or more green garlic bulblets, or an equivalent quantity of dry or partly dry bulblets, in 500 grams of mixed grain.

Grades.—Garlicky Mixed Grain shall be graded and designated according to the grade requirements of the standards applicable to such mixed grain if it were not garlicky, and there shall be added to, and made a part of, the grade designation, the word "Garlicky."

Weevily Mixed Grain

Definition.—Weevily Mixed Grain shall be mixed grain which is infested with live weevils or other insects injurious to stored grain.

Grades.—Weevily Mixed Grain shall be graded and designated according to the grade requirements of the standards applicable to such mixed grain if it were not weevily, and there shall be added to, and made a part of, the grade designation, the word "Weevily."

Blighted Mixed Grain

Definition.—Blighted Mixed Grain shall be all mixed grain in which barley predominates and which, as a whole, contains more than 4 percent of barley damaged or materially discolored by blight and/or mold.

Grades.—Blighted Mixed Grain shall be graded and designated according to the grade

requirements of the standards applicable to such mixed grain if it were not blighted, and there shall be added to, and made a part of, the grade designation, the word "Blighted."

Treated Mixed Grain

Definition.—Treated Mixed Grain shall be mixed grain which has been scoured, limed, washed, sulphured, or treated in such a manner that its true quality is not reflected by either the numerical grade or the Sample grade designation, alone.

Grades.—Treated Mixed Grain shall be graded and designated according to the grade requirements of the standards applicable to such mixed grain if it were not treated, and there shall be added to, and made a part of, the grade designation, a statement indicating the kind of treatment.

Definitions

Basis of grade determinations.—All determinations shall be on the basis of the grain as a whole.

Percentages.—Percentages, except in the case of moisture, shall be percentages ascertained by weight.

Percentage of moisture.—Percentage of moisture shall be that ascertained by the apparatus and the method of use thereof specified in the official grain standards of the United States for the kind of grain which predominates in the mixture.

Test weight per bushel.—Test weight per bushel shall be the weight per Winchester bushel as determined by the testing apparatus and the method of use thereof described in Bulletin No. 1065, dated May 18, 1922, issued by the United States Department of Agriculture, or as determined by any device and method which give equivalent results in the determination of test weight per bushel.

Foreign material.—Foreign material shall include all matter other than grains for which standards have been established under the provisions of the United States Grain Standards Act, but shall not include wild oats.

Damaged kernels.—Damaged kernels shall be all kernels and pieces of kernels of those grains for which standards have been established under the provisions of the United States Grain Standards Act, which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged.

Heat-damaged kernels.—Heat-damaged kernels shall be kernels and pieces of kernels of those grains for which standards have been established under the provisions of the United States Grain Standards Act, which have been materially discolored and damaged by external heat or as a result of heating caused by fermentation.

IMPORTANT FEATURES OF GRAIN INSPECTION

The United States Grain Standards Act provides in part as follows:

INSPECTION REQUIREMENTS

"SEC. 4. That whenever standards shall have been fixed and established under this act for any grain no person thereafter shall ship or deliver for shipment in interstate or foreign commerce any such grain which is sold, offered for sale, or consigned for sale by grade unless the grain shall have been inspected and graded by an inspector licensed under this act and the grade by which it is sold, offered for sale, or consigned for sale be one of the grades fixed therefor in the official grain standards of the United States: *Provided*, That any person may sell, offer for sale, or consign for sale, ship or deliver for shipment in interstate or foreign commerce any such grain by sample or by type, or under any name, description, or designation which is not false or misleading, and which name, description, or designation does not include in whole or in part the terms of any official grain standard of the United States: *Provided further*, That any such grain sold, offered for sale, or consigned for sale by grade may be shipped or delivered for shipment in interstate or foreign commerce without inspection at point of shipment by an inspector licensed under this act, to or through any place at which an inspector licensed under this act is located, subject to be inspected by a licensed inspector at the place to which shipped or at some convenient point through which shipped for inspection, which inspection shall be under such rules and regulations as the Secretary of Agriculture shall prescribe, and subject further

to the right of appeal from such inspection, as provided in section 6 of this act: *And provided further*, That any such grain sold, offered for sale, or consigned for sale by any of the grades fixed therefor in the official grain standards may, upon compliance with the rules and regulations prescribed by the Secretary of Agriculture, be shipped in interstate or foreign commerce without inspection from a place at which there is no inspector licensed under this act to a place at which there is no such inspector, subject to the right of either party to the transaction to refer any dispute as to the grade of the grain to the Secretary of Agriculture, who may determine the true grade thereof. No person shall in any certificate or in any contract or agreement of sale or agreement to sell by grade, either oral or written, involving, or in any invoice or bill of lading or other shipping document relating to, the shipment or delivery for shipment, in interstate or foreign commerce, of any grain for which standards shall have been fixed and established under this act, describe, or in any way refer to, any of such grain as being of any grade other than a grade fixed therefor in the official grain standards of the United States."

MISREPRESENTATION

"SEC. 5. That no person, except as permitted in section 4, shall represent that any grain shipped or delivered for shipment in interstate or foreign commerce is of a grade fixed in the official grain standards other than as shown by a certificate therefor issued in compliance with this act; and the Secretary of Agriculture is authorized to cause examinations to be made of any grain for which standards shall have been fixed and established under this act, and which has been certified to conform to any grade fixed therefor in such official grain standards, or which

has been shipped or delivered for shipment in interstate or foreign commerce. Whenever, after opportunity for hearing is given to the owner or shipper of the grain involved, and to the inspector thereof if the same has been inspected, it is determined by the Secretary that any quantity of grain has been incorrectly certified to conform to a specified grade, or has been sold, offered for sale, or consigned for sale under any name, description, or designation which is false or misleading, he may publish his findings."

APPEALS, FINDINGS, AND FEES

"SEC. 6. That whenever standards shall have been fixed and established under this act for any grain and any quantity of such grain sold, offered for sale, or consigned for sale, or which has been shipped, or delivered for shipment in interstate or foreign commerce shall have been inspected and a dispute arises as to whether the grade as determined by such inspection of any such grain in fact conforms to the standard of the specified grade, any interested party may, either with or without reinspection, appeal the question to the Secretary of Agriculture, and the Secretary of Agriculture is authorized to cause such investigation to be made and such tests to be applied as he may deem necessary and to determine the true grade: *Provided*, That any appeal from such inspection and grading to the Secretary of Agriculture shall be taken before the grain leaves the place where the inspection appealed from was made and before the identity of the grain has been lost, under such rules and regulations as the Secretary of Agriculture shall prescribe. Whenever an appeal shall be taken or a dispute referred to the Secretary of Agriculture under

this act, he shall charge and assess, and cause to be collected, a reasonable fee, in amount to be fixed by him, which fee, in case of an appeal, shall be refunded if the appeal is sustained. All such fees, not so refunded, shall be deposited and covered into the Treasury as miscellaneous receipts. The findings of the Secretary of Agriculture as to grade, signed by him or by such officer or officers, agent or agents, of the Department of Agriculture as he may designate, made after the parties in interest have had opportunity to be heard, shall be accepted in the courts of the United States as prima facie evidence of the true grade of the grain determined by him at the time and place specified in the findings."

LICENSING OF INSPECTORS

"SEC. 7. The Secretary of Agriculture may issue a license to any person, upon presentation to him of satisfactory evidence that such person is competent, to inspect and grade grain and to certificate the grade thereof for shipment or delivery for shipment in interstate or foreign commerce, under this act and the rules and regulations prescribed thereunder. No person authorized or employed by any State, county, city, town, board of trade, chamber of commerce, corporation, society, partnership, or association to inspect or grade grain shall certify, or otherwise state or indicate in writing, that any grain for shipment or delivery for shipment in interstate or foreign commerce, which has been inspected or graded by him, or by any person acting under his authority, is of one of the grades of the official grain standards of the United States, unless he holds an unsuspended and unrevoked license issued by the Secretary of Agriculture. * * *"

PENALTIES

"SEC. 9. That any person who shall knowingly violate any of the provisions of sections 4 or 7 of this act, or any inspector licensed under this act who shall knowingly inspect or grade improperly any grain which has been shipped or delivered for shipment in interstate or foreign commerce, or shall knowingly give any false certificate of grade, or shall accept money or other consideration, directly or indirectly, for any neglect or improper performance of duty, and any person who shall improperly influence or attempt to improperly influence any such inspector in the performance of his duty, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not more than $1,000, or be imprisoned not more than one year, or both."

REGULATIONS

Section 8 of the Grain Standards Act authorizes the Secretary of Agriculture to make such rules and regulations as he may deem necessary for the efficient execution of the provisions of the Act. Pursuant to this authority, the Secretary of Agriculture has issued regulations under the Act. Copy of the regulations as well as the complete text of the Act may be had upon application to any office of the Grain Branch, or to the Administrator, Production and Marketing Administration, Washington 25, D. C.

BASIS OF INSPECTION

The basis of inspection for commercial lots of grain is governed by instructions which are summarized as follows:

In the case of a car, truck, or wagon lot of grain which is generally or reasonably uniform in quality and condition throughout the lot. the

grade should be based on a representative sample resulting from a composite of the probings taken from different parts of the lot.

In the case of a car, truck, or wagon lot of grain which is not generally uniform as to quality or condition, care must be exercised, in basing the grade, to insure that the grade assigned will reflect as nearly as may be the quality of the entire lot of grain. In cases where the variations in quality or condition are not material, the grade should be based on a composite sample of all the probings taken from different parts of the lot. However, in cases where the variations in quality or condition are marked by distinct and outstanding differences between portions of the grain, each portion should be regarded as if it were a separate lot or unit for inspection and grading, and the grade of each portion should be based upon a sample representative of it.

In the inspection and grading of lots, parcels, and cargoes of grain loaded aboard boats, barges, and other vessels, licensed inspectors shall be governed by the following requirements:

1. If such a lot, parcel, or cargo tendered for inspection and grading be uniform in quality and condition, the grade shall be based upon an average sample thereof;

2. If such lot, parcel, or cargo so tendered is not uniform in quality and condition by reason of the presence therein of a material portion of grain of a different grade, the licensed inspector shall consider the portions of such lot, parcel, or cargo which are of different grades as separate lots tendered for inspection, and shall separately inspect, grade, and certificate as to grade such different portions; and each such certificate of grade shall bear a statement to the effect that the grain to which it applies has been loaded on board with other grain, the grade, description, and approximate quantity of which shall be specified.

SAMPLING OF GRAIN

The taking of a correct and representative sample of a lot or parcel of grain for inspection and grading purposes is an important and essential part of grain inspection. If the sample obtained is not representative no amount of care in making the determinations for the grading factors will establish the true grade of the grain involved. The Department of Agriculture, in its administration of the Grain Standards Act, holds that the licensed inspector is responsible for the correctness of the sample upon which he bases the grade of any lot or parcel of grain. For correct grading it is essential that the sample, properly identified, be preserved in its original condition from the time it is taken until the grade is determined and that it be of sufficient size to permit the required tests to be performed.

It is provided in part in Section 26.21 of the regulations of the Secretary under the Act that no licensed inspector shall issue a certificate of grade for any grain unless the inspection and grading thereof be based upon a correct and representative sample of the grain. No sample shall be deemed to be representative unless of the size, and procured in accordance with the methods, prescribed in instructions issued by the Administrator, Production and Marketing Administration, or by such officer of the Department as may be designated by him for the purpose, which are in effect at the time of the inspection and grading.

The basic instructions governing the methods for sampling grain are summarized as follows:

The size of the sample shall be not less than approximately 2 quarts. If the time to elapse between the drawing of the sample and the determination of the grade would permit of such changes in the condition of the sample as to affect the grade assigned to the lot or parcel from which

the sample was taken, at least 1⅛ pints of the grain shall be enclosed in an air-tight container and the remainder, if any, in a cloth bag.

In the case of bulk grain in a car, truck, or wagon, or in any other container in which the grain is of about the same depth as in a carload, the sample shall be taken with a double-tube 11-compartment probe 62⅞ inches long (fig. 2) by probing flaxseed in seven or more places and all other kinds of grain in five or more places, well distributed in different parts of the car, truck, or other container. In the discretion of the sampler and/or inspector, as many more probings as may be necessary shall be taken from the grain in different parts of the lot.

In the case of bulk grain tendered for inspection as it lies in a boat, barge, or other vessel, samples shall be taken with a double-tube compartment grain probe of either standard or special length by probing at regular spaced intervals throughout the entire lot, provided that all of the grain so tendered is accessible for proper sampling. If the grain is of such depth or stowed in such a manner that representative samples of the entire lot cannot be obtained by the sampling methods prescribed in this paragraph, the grain shall be considered as inaccessible for sampling within the vessel.

In the case of bulk grain being loaded for inspection and grading aboard a boat, barge, or other vessel, the sample shall be taken from the loading spout or other convenient place en route, by the use of a device known as "The Pelican spout sampler" (fig. 1) or any other device giving equivalent results. The stream or streams shall be sampled at regular and frequent intervals to assure a correct and representative sample of the lot.

In the case of grain tendered for inspection as it is being discharged from a boat, barge, or other vessel, the sample shall be taken from the running stream or at some other convenient place

after it leaves the vessel and before its identity is lost, provided the sample is not taken from grain moving on a horizontal belt where a cut of a full cross section of the stream is impracticable. The sample shall be taken in such a manner that it will be a correct and representative sample of the lot.

If after examination of the separate probes, or cuts with the Pelican, no material portion of the grain is distinctly inferior to the remainder of the grain, the grain from the separate probes or from each separate cut with the Pelican, shall be combined and the combined sample shall be regarded as an average sample of the grain involved.

Whenever it shall appear, as a result of the sampling, that a material portion of any lot or parcel of grain is distinctly inferior, in any manner, to the remainder of such lot or parcel; also whenever, in the case of grain loaded, or being loaded aboard, or being discharged from, a barge, boat, or steamship, a material portion of such grain is of a different grade from the remainder, separate samples shall be taken of such distinctly inferior grain and of the remaining portion, or of the grain of each of the distinctly different grades, as the case may be. There shall be filed with each of the separate samples so taken a statement of the estimated quantity of grain it represents.

The detailed official current instructions for the proper sampling of grain may be obtained by applying to any office of the Grain Branch.

SPOUT SAMPLER OR "PELICAN"

For obtaining a representative sample from a falling stream of bulk grain, and particularly for sampling bulk grain being spouted into the holds of a vessel, a spout sampler, generally referred to as a "Pelican" (fig. 1), is used.

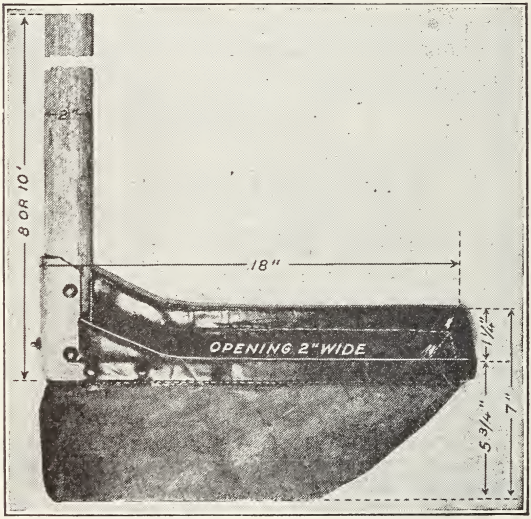

FIGURE 1.—Spout sampler (Pelican).

The use of this device makes it possible to obtain complete cross sections from the stream of grain being sampled. In operation the stream of grain is cut at frequent intervals and the samples obtained are then reduced in size by being put through a Boerner sampler (fig. 3).

GRAIN PROBE (TRIER) AND SAMPLING CANVAS

For obtaining a representative sample from a carload of bulk grain, a double-tube, 11-compartment grain probe (trier) as shown in figure 2 is used. Such a probe makes it possible for the sampler ordinarily to note any unevenness in loading and to ascertain the approximate location and quantity of any mixture of grain or of dirty, smutty, heating, or damp spots, etc., found in any part of the grain.

A canvas 29½ inches by 63 inches in dimensions on which to empty the grain from the probe is used. The grain should be emptied lengthwise on the canvas, each separate probeful apart from the others, so that the grain from each compartment can be examined separately.

Detailed specifications and drawings of the probe, and specifications for the canvas may be obtained by applying to any office of the Grain Branch.

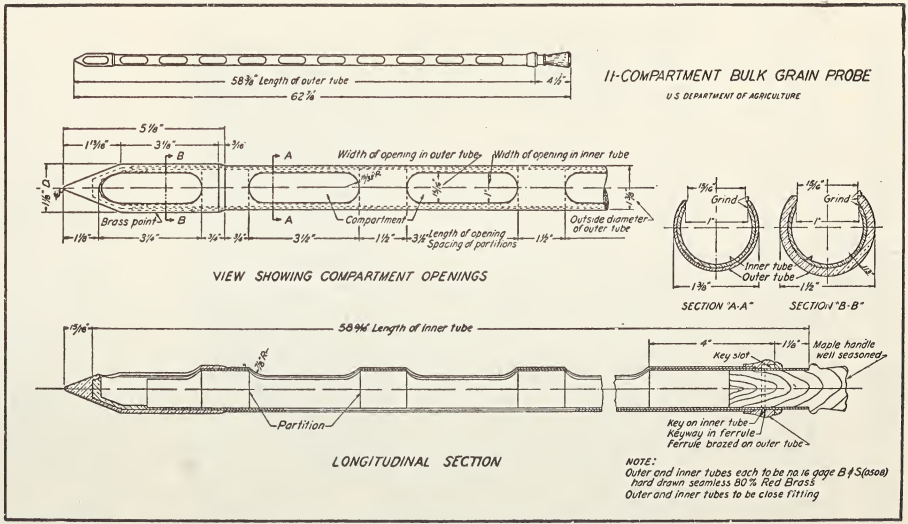

FIGURE 2.—Bulk grain probe (trier).

SAMPLE DIVIDER (BOERNER SAMPLER)

After a representative sample of the lot or parcel of grain to be graded is obtained, it is usually necessary to reduce its size considerably, in order that the grade may be determined by careful analysis. To reduce the size of a sample of grain containing foreign substances of different specific gravity or size than of the grain with which they are mixed, and at the same time obtain a sample as representative as the original, is hardly possible except by mechanical means.

Figure 3 shows a device, generally referred to as the "Boerner sampler", which will divide a sample into smaller portions and still maintain the proper proportions for the various factors of the original sample. In the operation of this device the grain is placed in a hopper at the top of the machine and is then released, when it passes through an opening at the bottom of the hopper and down the sides of a cone, the point of which is directly under the center of the opening. Arcund the base of the cone are 36 pockets or openings. The grain falling down the sides of the cone is cut into 36 separate streams, which, a little farther on, merge into 2 streams. Streams nos. 1, 3, 5, etc., unite into 1 stream which empties into one receptacle, and streams nos. 2, 4, 6, 8, etc., unite into another stream which empties into a second receptacle.

This device and a simplified form of it are fully described in United States Department of Agriculture Bulletin No. 287.

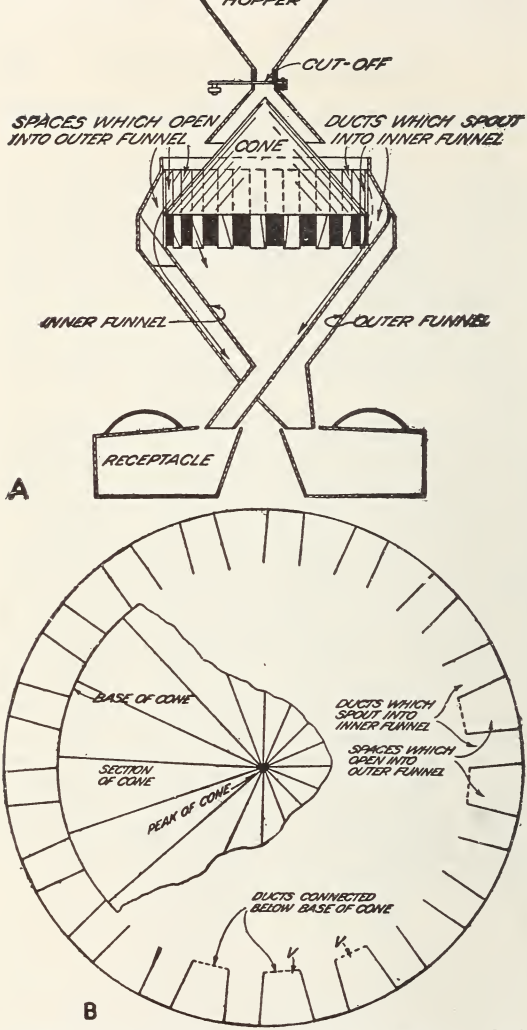

FIGURE 3.—Sample divider: *A*, vertical cross section of device showing paths taken by the material in passing from the hopper to the container; *B*, cross section of the device at the base of the cone.

FEDERAL DOCKAGE TESTER

A Federal dockage tester with which uniform results can be obtained is used in all offices of the Grain Branch and by many grain inspectors in making dockage tests and certain designated sieving tests of grain. (Fig. 4.) Information concerning the Federal dockage tester and its method of use may be obtained by applying to any office of the Grain Branch.

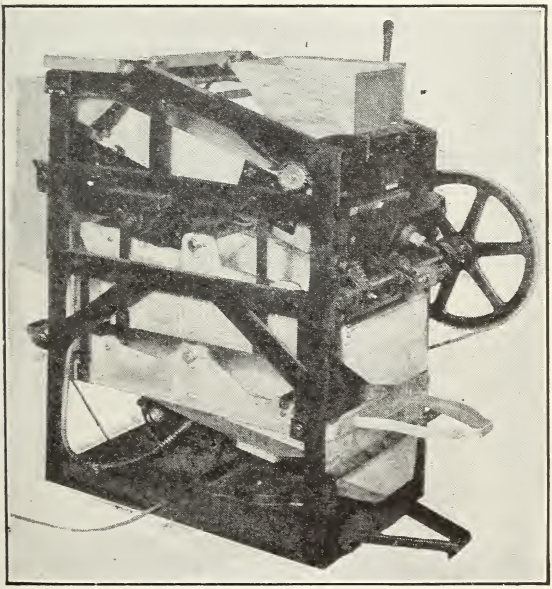

FIGURE 4.—Federal dockage tester.

GRAIN-TESTING SIEVES

Standardized grain-testing sieves with accurate perforations are essential in making uniform sieving and dockage tests. Standardized sieves are specified for use in connection with the enforcement of the United States Grain Standards Act. These sieves are constructed from half hard aluminum sheet metal 20 gage (B. & S.) thick, and are perforated as described in the following table. The maximum tolerance permitted in the accuracy of perforations is plus or minus 0.0005 inch, except that no tolerance is specified for the length dimensions of slotted perforations. The completed sieves are made up in the form of flat sieves or as step metal sieves for use in a dockage machine or as hand sieves. The hand sieves are 13 inches in diameter, and have slightly flaring sides 2 inches high, with rolled-top edges, and are made to nest with each other and with a bottom pan. Decimal specifications for the size of sieve perforations should be used in the manufacturing of grain-testing sieves.

Specifications for sieve perforations

Size of perforations		Number of perforations per square foot
Common designations (inches)	Decimal equivalents (inches)	
ROUND HOLE PERFORATIONS		
2½/64 diameter	0.0390	27,970
4½/64 diameter	.0703	13,795
5/64 diameter	.0781	6,705
1/12 diameter	.0833	9,820
8/64 diameter	.1250	4,736
12/64 diameter	.1875	2,640
TRIANGULAR PERFORATIONS WITH INSCRIBED CIRCLES OF—		
5/64 diameter	0.0781	2,845
0.089 diameter	.0890	2,875
SLOTTED PERFORATIONS		
3/64 by 3/8	0.0469 by 0.375	2,690
47/64 by 3/4	.076 by .75	865
8/64 by 3/4	.1250 by .75	4,736
9/64 by 3/4	.1406 by .75	
10/64 by ¾	.15625 by .75	
0.057 by 3/8	.057 by .375	2,500
0.064 by 3/8	.0640 by .375	2,705
0.070 by 1/2	.0700 by .50	1,655

In addition to the sieves listed above a wire mesh sieve is also used in grain inspection. This sieve which has rectangular openings in it is used in connection with the determination of Dockage in flaxseed. It is constructed of wire having a diameter of 0.015 inch, with 4 by 16 meshes per inch.

BASIS OF DETERMINATION FOR TEST WEIGHT PER BUSHEL

The official standards provide that the determination of the test weight per bushel in the case of wheat, rye, barley, and soybeans shall be made upon the basis of the grain from which the dockage has been removed; in the case of flaxseed the test-weight determination shall be made upon the basis of the flaxseed after the removal of that part of the dockage which can be removed readily by the use of appropriate sieves and cleaning devices; and in the case of all other grain the test-weight determination shall be made upon the basis of the grain as a whole.

As the test weight per bushel is one of the main factors in determining the grade of grain, 1⅛ quarts of the grain should be available to permit the test weight to be made with a quart tester.

STANDARD METHOD OF MAKING TEST-WEIGHT-PER-BUSHEL DETERMINATION

The conditions given in the method described below have been found to be essential in making uniform tests of weight per bushel and obtaining accurate results, and have been adopted as standard in connection with the enforcement of the United States Grain Standards Act.

(1) Make the test immediately after the sample has been brought to the inspection room, office, or laboratory, to prevent drying out of the grain with consequent change in its test weight.

(2) Use 1⅛quarts of grain for making the test.

(3) Fill the kettle from a hopper.

(4) Opening at bottom of hopper must be round and exactly 1¼ inches in diameter.

(5) Bottom of opening must be centered over the kettle and held exactly 2 inches above the top of kettle.

(6) The quart kettle must have a capacity of exactly 67.2 cubic inches. The inside height of the quart kettle shall be 4 inches.

(7) If the top of the kettle is rough, smooth down the roughness with a rounded metal bar, but do not use a file for the purpose.

(8) Have the kettle rest on a firm base.

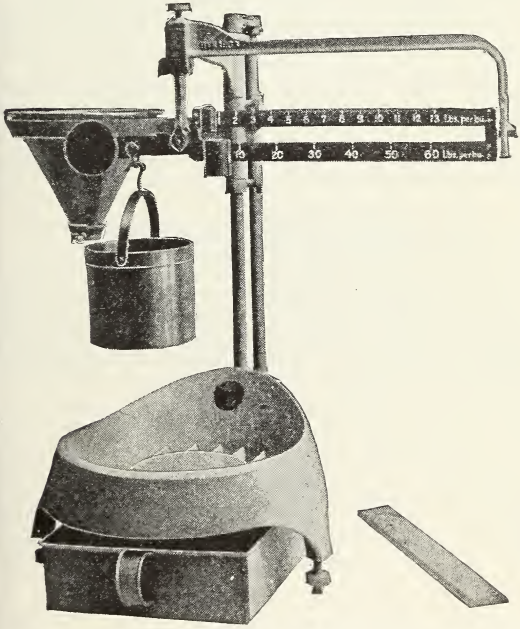

FIGURE 5.—Standard apparatus for determining the test weight per bushel of grain.

(9) Do not jar the kettle before or during the stroking operation.

(10) Use a stroker made of hardwood with smooth, perfect half-round edges, 12 inches long, ⅜ inch thick, and 1¾ inches broad.

(11) Place the stroker on the edge of the kettle lightly without jarring the kettle.

(12) Hold the stroker on the kettle with the sides of the stroker in a vertical position.

(13) Stroke the grain from the kettle with three full-length zigzag motions of the stroker.

(14) Make each stroke clean all the way across the kettle with the stroker always lightly touching the kettle.

(15) Use a beam which is both accurately graduated and sensitive to one-tenth pound per bushel.

(16) Have the weight-per-bushel apparatus tested periodically for—

(*a*) Accuracy of kettle,
(*b*) Accuracy of beam readings, and
(*c*) Sensitiveness of beam.

The method of testing the accuracy of the test kettle and the accuracy and sensitiveness of the weighing beam of any weight-per-bushel testing outfit is given in Department of Agriculture Bulletin No. 1065.

METHODS OF MAKING MOISTURE TESTS

The official standards for wheat, barley, oats, Feed Oats, Mixed Feed Oats, rye, grain corghums, flaxseed, and soybeans, specify that the percentage of moisture shall be that ascertained by the use of the air-oven method, and the standards for corn specify that the percentage of moisture shall be that ascertained by the use of the water-oven method, or, in all cases, that ascertained by any device and method which give equivalent results. The air-oven and the water-oven apparatus and their respective methods of use in the determination of moisture content are described in Service and Regulatory Announcements No. 147 of the Agricultural Marketing Service of the United States Department of Agriculture.

In order that rapid determinations of moisture in grain may be made to meet the routine requirements of practical inspection work, grain inspectors may use electric moisture meters or other apparatus and methods which give moisture-test results equivalent to the results obtained with the air-oven method or the water-oven method, as the case may be. Although the air-oven and water-oven methods are specified as the basic methods for determining moisture content for the purposes of the standards, it is intended that these methods will be used principally for the purpose of checking and standardizing the electric moisture meters or other moisture-testing equipment and methods used in routine grain-inspection work.

ELECTRIC MOISTURE METER

An electric moisture meter with which rapid determinations of the moisture content of grain can be made is in general use in grain-inspection work.

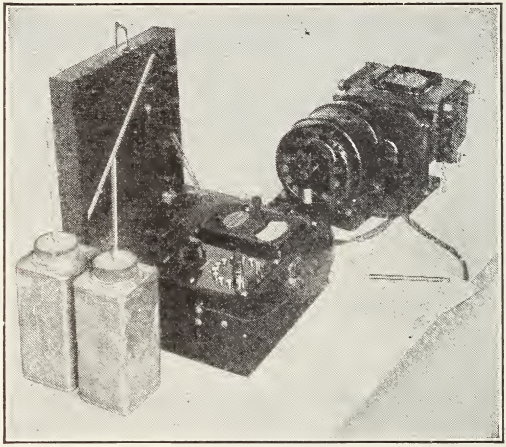

FIGURE 6.—Electric moisture meter.

A description of the method of using the electric moisture meter illustrated in figure 6, including the necessary conversion charts, is given in pamphlet U. S. G. S. A.–M. B. I.–1, the latest revised copy of which can be obtained from any office of the Grain Branch.

EQUIPMENT USED IN GRAIN INSPECTION

(1) Bulk grain probe.
(2) Spout sampler (Pelican).
(3) Sack probe (trier).
(4) Sampling canvas.
(5) Waterproof sample bags.
(6) Airtight containers.
(7) Sample divider (Boerner sampler).
(8) Dockage tester.
(9) Hand sieves.
(10) Test-weight-per-bushel apparatus.
(11) Moisture tester.
(12) Balances: one 1,200-gram and one 100-gram capacity.
(13) Barley pearler.
(14) Sulphur-testing apparatus.
(15) Smut dockage machine (for Pacific Coast).
(16) Miscellaneous: grain pans, tweezers, tables, etc.